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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/841,646 | 04/24/2001 | Katsunori Komori | 10873.690US01 | 6442 |
| 23552 | 7590 | 10/21/2003 | EXAMINER | |
| MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903 | | | CANTELMO, GREGG | |
| | | ART UNIT | | PAPER NUMBER |
| | | 1745 | | |

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 09/841,646 | KOMORI ET AL. | |
| | Examiner | Art Unit | |
| | Gregg Cantelmo | 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 02 September 2003.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-12 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 9, 2003 has been entered.

Response to Amendment

2. In response to the amendment received September 9, 2003:

- The 112 rejections have been withdrawn;
- The prior art rejections stand.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

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one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The amendment to claim 7 wherein the nickel-metal hydride battery having a total area X of the separator and amount Y of the electrolyte satisfying the relationship $Y/X \geq 41$ having a rating of at least 6.5 Ah is not held to be adequately supported by the original disclosure. First the only recitation of the term 6.5 Ah is a set value and not 6.5 Ah or greater. Thus the range in the preamble is not properly supported by the original disclosure. Second this value is associated with Example 1 and not clearly associated with Example 2, which recites the relationship of $Y/X \geq 41$. Thus it is not clear from the original disclosure that the particular amount of electrolyte contained in the separator per unit area at a value of 41 mg/cm² has a rating of either 6.5 Ah or at least 6.5 Ah. Therefore the amendment is held to constitute new matter.

Pending clarification to this issue, the Examiner is not giving patentable weight to the preamble.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The scope of the amount of electrolyte per unit area of the separator is unclear.

Claim 7 recites that the amount of electrolyte retained in the separator is at least 41 mg/cm². However dependent claims 1-6 recite that the amount of electrolyte is at least

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15 mg/cm², which is considerably below the lower limit of claim 7. Absent clarification the claims have been interpreted relative to the lower limit recited in the claims.

Claim Rejections - 35 USC § 102/103

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 3, 6, 7, 9 and 12 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over U.S. patent No. 5,032,475 (Hasebe).

The examiner has given patentable weight to the preamble since the body of claim 7 recites the term "the battery" therein which refers back to the battery recited in line 1 of each preamble, both being a nickel metal-hydride battery.

Hasebe discloses a nickel metal-hydride battery comprising: a case, positive electrode, negative electrode, separator and electrolyte (Fig. 1), wherein a the separator is a single layer. The separator is a nonwoven polypropylene material having a texture

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of 50-100 g/m² (col. 6, ll. 27-50). The instant application uses nonwoven polypropylene separator materials (paragraph bridging pages 5 and 6). In addition the separator of the instant application has a preferable (but not exclusive) weight of 60-85 g/m² (page 6, lines. 19-20). The range of separator weights of Hasebe encompasses the preferable separator weight and is of the same nonwoven fabric material employed in a nickel metal-hydride battery. Upon introduction of the electrolyte into the cell, there is a reasonable expectation that since the prior art separator is of the same material having the same characteristics as disclosed in the instant application, the prior art separator will have inherently retain at least 15 mg/cm² electrolyte (claim 1) and satisfy the relationship of $Y/X \geq 41$ as set forth in claim 7. The examiner has provided a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art in accordance with MPEP § 2112, incorporated herein.

The Examiner requires an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product (see MPEP § 2112). Whether the rejection is based on inherency' under 35 U.S.C. 102, on 'prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

The separator is a nonwoven polypropylene material having a texture of 50-100 g/m² (col. 6, ll. 27-50). The overlapping portion of the range of Hasebe anticipates the range of claims 6 and 12. Furthermore while the instant application discloses these ranges are preferable, there is no clear evidence than this range is critical over ranges which encompass the instant claimed ranges (as applied to claims 6 and 12).

Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical.

In re Boesche, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).

Claims 3 and 9 recite a process of pouring the electrolyte into the case. There does not appear to be any further definition of the product of claims 1 and 7 respectively.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742,

744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

"[T]he lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith." *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Response to Arguments

11. Applicant's arguments filed September 2, 2003 have been fully considered but they are not persuasive.

Due to the new matter issues raised by the Examiner in so far as the specification appears to lack clear support for the preambular recitation of the battery having a rating of at least 6.5 Ah, the Examiner has not accorded weight to this limitation pending clarification of the 112 new matter rejection.

In addition claim 7 does not require the mass of electrolyte as argued by Applicant since the claim fails to recite the mass. In addition it is unclear how the set value of 25g associated with amount of electrolyte retained in the separator is at least 41 mg/cm² can be argued as an approximate mass value when there is no such teaching of approximate values of the mass. There is no clear evidence that electrolyte mass of Hasebe as argued by applicant to be 20.3 is not sufficient enough to meet the amount of electrolyte retained in the separator is at least 41 mg/cm².

Furthermore the scope of claims 1 and 7 are not in agreement and therefore the actual scope of the amount of electrolyte per unit area of the separator is indefinite and interpreted to be within the lower limit range of claim 1.

Claim Rejections - 35 USC § 103

12. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe in view of JP 05 121061 A (JP '061).

The teachings of claim 7 have been discussed above and are incorporated herein (applied to claims 2 and 8, respectively).

The difference between claims 2 and 8 and Hasebe is that Hasebe does not disclose forming a separator of sulfonated polypropylene, and sulfur to carbon atoms in

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the separator satisfy the relationship of: the number of sulfur atoms / the number of carbon atoms = A wherein $2.0 \times 10^{-3} \leq A \leq 5.5 \times 10^{-3}$.

JP '061 discloses that it is desired to use a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of sulfur atoms to carbon atoms is in a range from 0.15×10^{-2} to 0.40×10^{-2} , this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3} (page 3, col. 4, ll. 24-31).

The motivation for providing a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of sulfur atoms to carbon atoms is in a range from 0.15×10^{-2} to 0.40×10^{-2} , this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3} is that it optimizes the absorbance of the electrolyte in the separator and tensile strength of the separator. Thus a separator having a sulfur to carbon ratio as taught by JP '061 has both improved electrolyte absorbance and tensile strength.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Hasebe by providing a sulfonated polypropylene separator in an alkaline storage battery wherein the ratio of sulfur atoms to carbon atoms is in a range from 0.15×10^{-2} to 0.40×10^{-2} , this range equivalent to a range from 1.5×10^{-3} to 4.0×10^{-3} , since it would have optimized the absorbance of the electrolyte in the separator and tensile strength of the separator. Thus the separator of Hasebe having a sulfur to carbon ratio as taught by JP '061 would have had both improved electrolyte absorbance and tensile strength.

13. Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe in view of JP 07 099050 A (JP '050)

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In the event that the 102/103 rejection of claims 3 and 9 above is overcome:

The teachings of claim 7 have been discussed above and are incorporated herein (applied to claims 3 and 9, respectively).

The difference between claims 3 and 9 and Hasebe is that Hasebe does not disclose providing the electrolyte via a vacuum atmosphere.

Introducing the electrolyte into the cell by a vacuum injection is well known in the art as evidenced by JP '050 (abstract).

The motivation for providing an electrolyte to the cell by using a vacuum injection technique is that it reduces the electrolyte permeating period, pours the electrolyte to a precise quantity and raises the performance reliability of the cell (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Hasebe by providing an electrolyte which is vacuum injected since it would have reduced the electrolyte permeating period, poured the electrolyte to a precise quantity and raised the performance reliability of the cell.

14. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe in view of JP 52 070131 A (JP '131).

The teachings of claim 7 have been discussed above and are incorporated herein (applied to claims 4 and 10, respectively).

The difference between claims 4 and 10 and Hasebe is that Hasebe does not disclose of the separator having a specific surface area ranging from 0.6 m²/g to 0.9 m²/g.

JP '131 is drawn to separators used in a secondary battery wherein the characteristics of the separator are optimized. In particular the separator has a specific surface area of $0.4 \text{ m}^2/\text{g}$ or greater (abstract and claim 2). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for configuring the separator to have a specific surface area of $0.4 \text{ m}^2/\text{g}$ or greater is that it provides a separator design which has high mechanical strength and improved ion transmittance (abstract).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Hasebe by configuring the separator to have a specific surface area of $0.6 \text{ m}^2/\text{g}$ to $0.9 \text{ m}^2/\text{g}$ since it would have provided a separator design which has high mechanical strength and improved ion transmittance.

15. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasebe in view of U.S. patent No. 4,137,379 (Schmidt).

The teachings of claim 7 have been discussed above and are incorporated herein as applied to claims 5 and 11 respectively.

The difference between claims 5 and 11 and Hasebe is that Hasebe does not disclose of the separator having a median pore diameter of not larger than 30 microns on a volume basis when pores are measured in a range of 0.1 microns to 360 microns with a mercury porosimeter (claims 5 and 11).

Schmidt discloses that it is desirable to have a porous polyolefin separator having an average pore size from about 0.5 to 15 microns and preferably about 1 to 10 microns (col. 2, ll. 44-49). In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919, F.2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990).

The motivation for having a porous polyolefin separator having an average pore size from about 0.5 to 15 microns and preferably about 1 to 10 microns is that it provides a separator having excellent mechanical and electrical properties.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Hasebe by selecting the average pore diameter to be from about 0.5 to 15 microns and preferably about 1 to 10 microns since it would have provided a separator having excellent mechanical and electrical properties.

Response to Arguments

16. Applicant's arguments have been considered. See item 11 above, incorporated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-

0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo
Patent Examiner
Art Unit 1745

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October 20, 2003